

## Original Article

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# Pattern of Smoking and Nicotine Dependence in Patients with Psychiatric Disorders

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**Background:** Smoking prevalence is high among psychiatric patients. This study aimed to evaluate the prevalence of smoking, related factors and nicotine dependence in patients suffering from psychiatric disorders.

**Materials and Methods:** This analytical descriptive study was performed on patients who had been hospitalized for at least 2 days in Razi Hospital during 2010. Data were collected via an interview and the obtained information was recorded in a questionnaire. Fagerstrom test was also used. After determining the prevalence of smoking in these patients, the related factors and nicotine dependence were also evaluated using multiple logistic regression test and SPSS software.

**Results:** A total of 78.4% of men and 36.2% of women in this study were smokers and 64.4% had high nicotine dependence. Final logistic regression models showed that smoking was related with advanced age, male sexuality, hookah consumption, and depression. High nicotine dependence was correlated with hookah consumption and history of suicide attempt.

**Conclusion:** Prevalence of smoking is higher among psychiatric patients compared to the public. Adequate intervention and strategies are necessary in these patients to promote smoking cessation.

**Key words:** Tobacco, Cigarette, Dependence, Psychiatric disorders

## INTRODUCTION

Nicotine dependence is found in only 12.8% of the population in the US; whereas, those suffering from psychiatric disorders consume 57.5% of all cigarettes smoked in this country (1). Prevalence of smoking is much higher among psychiatric patients than normal population (2). In many European countries as well as in the US, individuals with a history of psychological disorders smoke about 2 folds higher than the normal population (3). A study conducted in Germany showed that smokers are more susceptible to psychiatric disorders (4). In contrast to the mentioned countries, prevalence of smoking has not been well evaluated in developing countries. Considering

the economical state of developing countries, the vast market of tobacco products and susceptibility of psychiatric patients, prevalence of smoking among them in these countries is expected to be high (5).

According to the WHO report in 2008, about 20.9% of men and 2.9% of women and in general, 11.9% of the country's population are daily smokers (6). In another study conducted in Iran in 2005, a total of 25,180 subjects were questioned and presence of mental disorders in them was evaluated according to the Diagnostic and Statistical Manual of Mental Disorders-IV-TR. Prevalence of psychiatric disorders, anxiety, mood disorders and psychotic disorders was 10.81%, 8.35%, 4.29%, 0.89%,

respectively (7). No study was found to evaluate the prevalence of smoking, related factors and nicotine dependence in patients with mental disorders in Tehran.

This study was performed aiming at determining the prevalence of tobacco consumption, related factors and nicotine dependence in psychiatric patients hospitalized in Razi Teaching Psychiatric Hospital which is one of the greatest educational psychiatric centers in Iran.

## **MATERIALS AND METHODS**

This analytical descriptive study was conducted on psychiatric patients who had been hospitalized for a minimum of 2 days at Razi Hospital during July to September 2010. Simple sampling method was used and final analysis was performed on a total of 816 subjects who answered the questions regarding tobacco consumption. The value of the questionnaire filled out by a patient depended on his insight. Patients who were in stage 1 of insight (denial phase) were excluded from the study. Insight was defined as the capacity of a patient to recognize his/her illness. Stages of insight are as follows:

- 1- Complete denial of illness
- 2- Slight awareness of being sick and requiring help but denying it at the same time
- 3- Awareness of being sick but blaming it on others and external factors
- 4- Awareness of being sick but blaming it on medical or unknown organic factors
- 5- Intellectual insight: Admission of illness and recognition that symptoms or failures in social adjustments are due to irrational feelings or disturbances
- 6- True emotional insight. Emotional awareness of the motives and feelings within and of the underlying meanings of symptoms, whether or not the awareness leads to changes in personality and behavior, openness to new ideas and concepts about self, and important people in ones' life (8).

Those who met the inclusion criteria gave a written consent to participate in the study. Study protocol was approved by the Ethics Committee of Tobacco Prevention and Control Research Center. Data were collected via an interview and entered a questionnaire. The questionnaire

included demographic characteristics (sex, age, level of education, and marital status), smoking status (history of smoking, current state of tobacco consumption, number of quit attempts, and family history of smoking), patient's current health status (type of disease based on DSM-IV-TR criteria and approval of the psychiatrist), and current medication intake (typical and atypical anti-psychotics, heterocyclic antidepressants, SSRI, mood stabilizers, anticholinergics, benzodiazepines, and ECT in terms of daily dosage and duration of use). In order to assess the scientific credibility of the questionnaire, its content validity was evaluated. In order to do so, the questionnaire was designed and prepared using text books and published studies in the literature and then was offered to 5 faculty members of Tehran medical universities to evaluate its content. Necessary changes were made according to their points of view and the questionnaire was revised. In order to determine nicotine dependence, Fagerstrom test which is the gold standard for this purpose was employed. This test is comprised of 6 questions regarding the time of smoking the first cigarette after waking up in the morning, number of daily cigarettes smoked, best cigarette of the day, tendency to smoke at the time of illness, and tendency to smoke at inhibited places. Based on the total score gained, subjects are categorized into groups of low, moderate and high nicotine dependence (9). In this study, scores less or equal to 3 were considered as low and scores more than 3 were categorized as high nicotine dependence (5).

For data analysis, first prevalence was calculated for all subjects and based on gender. Then related factors (smokers vs. non smokers and ex smokers) and nicotine dependence ( $FTND > 3$  vs.  $FTND \leq 3$ ) were separately evaluated using multiple logistic regression test and SPSS version 16 software. In this study, age, sex, level of education, history of hookah consumption, type of psychiatric disorder, and suicide attempt variables were entered the final model in both analyses.  $P < 0.05$  was considered statistically significant.

## **RESULTS**

### **Characteristics of the participants:**

Of a total of 984 patients 950 consented to participate in the study and were able to communicate with the

questioners of which 816 (participation rate: 82.9%) answered the questions regarding tobacco consumption. Final analysis was performed on the mentioned 816 subjects. There were 653 males with a mean age of  $43.48 \pm 12.73$  yrs (range 18-72 yrs) and 163 females with a mean age of  $52.76 \pm 14.94$  yrs (range 16-88 yrs). The mean age of women was significantly higher than men ( $P < 0.001$ ). Most subjects were single (63.5%), unemployed (57.6%), with educational level lower than high school diploma (79.3%). Only 14.9% of participants were home owners.

#### Prevalence of smoking and related factors:

A total of 70% of participants were smokers (78.4% of men and 36.2% of women). Also, 39% of subjects had hookah consumption (Table 1). Final logistic regression model showed that risk of smoking increased with

advanced age ( $P < 0.001$ ). Men smoked 6.58 times more than women ( $P < 0.001$ ) and hookah consumers smoked 6.14 times more than those who did not ( $P < 0.001$ ). Also, depressed patients smoked 54% less than schizophrenics ( $P = 0.04$ ) (Table 2).

#### Prevalence of nicotine dependence and related factors:

Of 571 smokers 22 (3.9%) did not respond to Fagerstrom test. A total of 64.4% of smokers had high nicotine dependence (Table 1). Final logistic regression model showed that nicotine dependence was 2.41 times higher in those who mentioned hookah consumption ( $P < 0.001$ ) and 1.56 times greater in those who had a history of suicide attempt ( $P = 0.04$ ) (Table 3).

**Table 1.** Smoking status and nicotine dependence.

	Number (Percentage)	Female	Male
<b>Participant's smoking status</b>			
Smoker	571 (70)	59 (36.2)	512 (78.4)
Ex-smoker	39 (4.8)	12 (7.4)	27 (4.1)
Non-smoker	206 (25.2)	92 (56.4)	114 (17.5)
Total	816 (100)	163 (100)	653 (100)
<b>Hookah consumption</b>			
Yes	299 (39)	30 (19.1)	269 (44.2)
No	517 (61)	133 (80.9)	384 (55.8)
Total	816 (100)	163 (100)	653 (100)
<b>Nicotine dependence</b>			
Low ( $\leq 3$ )	181 (31.7)	14 (23.7)	167 (32.6)
High ( $> 3$ )	368 (64.4)	37 (62.7)	331 (64.6)
No response	22 (3.9)	8 (13.6)	14 (2.7)
Total	571 (100)	59 (100)	512 (100)

**Table 2.** Smoking related factors: results of univariate and multivariate regression analysis

Variable	Univariate analysis OR (95% CI)	P-value	Multivariate analysis OR (95% CI)	P-value
<b>Age</b>	0.97(0.96-0.98)	<0.001	1.02 (1.00-1.04)	<0.001
<b>Sex</b>				
Female	Reference 1	<0.001	Reference 1	<0.001
Male	6.40 (4.42-9.26)		6.58(4.10-10.56)	
<b>Level of education</b>				
Below high school diploma	Reference 1		Reference 1	
High school diploma	1.66(1.03-2.68)	0.034	1.07(0.61-1.88)	0.802
College/University	0.88(0.43-1.81)	0.744	1.01(0.44-2.30)	0.965
<b>Hookah consumption</b>				
Yes	6.36(4.20-9.63)	<0.001	6.14(3.73-10.12)	<0.001
No	Reference 1		Reference 1	
<b>Type of psychiatric disorder</b>				
Schizophrenia	Reference 1		Reference 1	
Bipolar disorder	0.84 (0.56-1.26)	0.40	0.81 (0.47-1.38)	0.44
Depression	0.93 (0.59-1.47)	0.78	0.54(0.30-0.97)	0.04
Other	1.20 (0.81-1.79)	0.35	1.03(0.62-1.71)	0.90
<b>Suicide attempt</b>				
Yes	2.12 (1.45-3.12)	<0.001	1.48(0.90-2.43)	0.116
No	Reference 1		Reference 1	

**Table 3.** Factors related to nicotine dependence: results of univariate and multivariate regression analysis

Variable	Univariate analysis OR (95% CI)	P-value	Multivariate analysis OR (95% CI)	P-value
<b>Age</b>	0.99 (0.98-1.01)	0.759	0.98(0.97-1.00)	0.130
<b>Sex</b>				
Female	Reference 1	0.638	Reference 1	0.389
Male	1.15(0.62-2.13)		1.36(0.67-2.79)	
<b>Level of education</b>				
Below high school diploma	Reference 1		Reference 1	
High school diploma	1.11(0.70-1.75)	0.650	0.98(0.59-1.61)	0.948
College/University	1.00(0.42-2.38)	0.997	0.88(0.34-2.28)	0.797
<b>Hookah consumption</b>				
Yes	2.42(1.67-3.50)	<0.001	2.41(1.58-3.68)	<0.001
No	Reference 1		Reference 1	
<b>Type of psychiatric disorder</b>				
Schizophrenia	Reference 1		Reference 1	
Bipolar disorder	1.65(1.03-2.64)	0.034	1.45(0.86-2.46)	0.157
Depression	1.00(0.59-1.71)	0.979	0.94(0.53-1.78)	0.947
Other	0.86(0.54-1.37)	0.548	0.97(0.58-1.62)	0.926
<b>Suicide attempt</b>				
Yes	1.73(1.19-2.51)	0.004	1.56(1.00-2.41)	0.046
No	Reference 1		Reference 1	

## DISCUSSION

This study showed that hospitalized males in Razi Hospital smoked 3.7 times more than women and 12.4 times more than normal population. These rates are higher than those mentioned in Chandra et al. study which showed that 36% of patients aged 18-65 yrs. hospitalized in a psychiatric hospital in India smoked (5). However, our prevalence rate was similar to that obtained by Ziaaddini et al. in Iran (10). Considering the smoking related morbidity and mortality, smoking control programs for these patients seem necessary.

In our study, men smoked 6.58 times more than women. This finding is in accord with that of most studies conducted in developing countries (5,6,11). The reason might be the fact that in the culture of such countries smoking is considered a decadent act for women. Therefore, women may deny smoking despite the researchers' utmost effort to obtain data in this regard.

About two third of the smokers in this study had high nicotine dependence. Ziaaddini et al. in 2009 in Kerman demonstrated that about 37.4% of schizophrenics and 32.8% of other psychiatric patients had high nicotine dependence (10). Nejad and Pouya also in Kerman showed that 28.7% of psychiatric patients had high nicotine dependence (12). These results show a lower dependence

rate compared to ours which may be attributed to the fact that they considered a higher reference rate. They considered scores over 7 as high nicotine dependence. Since no other study is available in this regard, further investigations in different cities of Iran are necessary on this matter.

Hookah consumers smoked 6.14 times more than those who did not and had a 2.41 times greater nicotine dependence. These findings are in accord with those of Chandra et al. who reported that smoking prevalence is higher among those who also consume other types of tobacco products (chewing tobacco). They also had higher nicotine dependence (5). Considering the epidemics of hookah consumption in the Middle East, new strategies are required to control this phenomenon.

This study showed that depressed patients smoked less than schizophrenics. Even though genetically, nicotinic receptors are prevalent in both bipolar disorder and schizophrenic patients (13). Schizophrenic patients have the highest prevalence of smoking among psychiatric patients (2). Researchers believe that there are mechanisms that result in higher tobacco consumption in this group of patients (14). A possible mechanism is that schizophrenic symptoms are due to an imbalance in cortical and subcortical dopaminergic function. Nicotine can facilitate

and increase the transfer of glutamate to cerebral cortex and result in elevation of dopamine levels and subsequently balance and improve this impairment (15,16).

Patients with a history of suicide attempt in our study had higher nicotine dependence.

Hughes in his review study reported three possible mechanisms that justify the correlation between smoking and suicide: 1- initiation of smoking is usually concomitant with an unfavorable event which increases the risk of suicide 2- smoking results in painful and disabling conditions that increase the risk of suicide attempt and 3- smoking decreases serum levels of serotonin and monoamine oxidase (17). This study also showed that such patients also have higher nicotine dependence.

Large understudy population in one of the biggest psychiatric hospitals in the country is a strength point of this study.

Of the limitations in this study we can mention the followings:

Some patients were excluded from the study because of their low level of insight. Researchers had to do this ethically. However, prevalence of smoking in such patients may be even higher than others. Considering the potential hazards of smoking, our study results enlighten the need for a more serious intervention by the authorities and health leaders in our country to control smoking. We hope that our study results be helpful for national smoking control programs. Also, more comprehensive interventions are required to decrease prevalence of smoking and nicotine dependence in normal population and among psychiatric patients as well.

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